The future is smart – meet piSMART™

Responding to the rallying call of Industry 4.0, Piab is introducing piSMART™ – more intelligent and cloud-connected versions of the company's most advanced vacuum technology products, kitted out for the smart factories of the future.

Aimed at maximising productivity and energy-efficiency, the new piSMART™ products will employ a user-friendly piSMART™ app for mobile phones and other handheld devices to gather data such as cycle time, energy consumption and more, getting them ready for Industry 4.0 factories, where all processes and components are automatically and digitally guided, controlled and verified.

piCOMPACT®, Piab's premium all-in-one vacuum ejector series, is the first of the company's products to be kitted out for this industrial revolution. Available with the generic and fieldbus-independent input/output technology IO-Link, piCOMPACT® offers sensor data output and actuator communication for real-time distributed control systems, enabling on-board intelligence with self-optimising features. Analogue signals indicating vacuum level changes can, for instance, be used in a Leakage Warning (LW) system. A cycle counting feature can reveal if the number of "picks per minute" is dropping over time, potentially indicating performance issues related to a build-up of dirt or blocked filters.

Communication links, fieldbuses and PLCs (programmable logic controllers) represent the basic process control level. Another service level of sensor data is now being added to support analysis tools using cloud-based "big data". A separate communication layer, directly from sensors and components such as piCOMPACT®, will offer a link to the cloud, providing on-demand access to huge amounts of valuable data. Used in a mobile phone or other handheld device, the new piSMART™ app will make all this available in the palm of the operator's hand.

IO-Link – the key to interoperability & information transparency

The adoption of IO-Link is the key, as it guarantees interoperability between different devices, regardless of the technology standard used in the overall system. An open standard, IO-Link is fieldbus and PLC neutral, providing a smart and simple gateway to any higher bus or PLC system. An IO-Link master can have one or multiple ports, whereas in a bus system each sensor, actuator or master is connected to one cable. An IO-Link master can act as a gateway to fieldbuses such as EtherNet/IP/profiNet/deviceNet/ethercat/Profibus.

IO-Link provides a platform for integrated communication and sensors, enabling successful information transparency, another important cornerstone for Industry 4.0. Hence, making equipment available with IO-Link can be viewed as a commitment to both interoperability and information transparency, indicating that Piab and piCOMPACT® are indeed Industry 4.0 ready.

Piab AB
P.O. Box 4501
SE-183 04 TÄBY
SWEDEN

Phone +46 (0)8 630 25 00
Fax +46 (0)8 630 26 90
E-mail info-sweden@piab.com
Website www.piab.com

Auto tuning cuts the risk of human error

Auto tuning of machines or machine parts is an example of the sort of technical assistance and decentralised decisions that form the basis for Industry 4.0. This is also an area where Piab has been busy introducing new equipment features promoting smart production. Piab's advanced features include the Automatic Level Determination (ALD) which automatically sets the optimal vacuum level in each cycle, ensuring no objects are accidentally dropped. Together with Automatic Condition Monitoring (ACM) ALD also supports an Energy Saving (ES) feature for minimised air consumption.

When objects are supposed to be dropped, the Intelligent Blow-Off (IBO) feature makes sure blow-off air is applied only when needed, enabling air consumption saving of up to 50 percent whilst maximising operator safety. Eliminating the risk of unwanted vacuum build up in suction cups, the Self Adhesion Control (SAC) adds another level of security in the system.

These important security aspects will be further strengthened through interconnections with the wider system and internet connectivity as this will enable more accurate auto tuning, ensuring that the equipment is used correctly. Real-time and accurate operator guidance will minimise the risk of human error.

Condition monitoring & predictive maintenance

Smart output data will also assist operators and can be used to automate or accelerate decisions regarding maintenance, performance adjustments and quality, and to fine-tune autonomous functions on components. Strategically placed smart sensors with internet connectivity will be able to seamlessly communicate data in real-time or near real-time, allowing them to predict and prevent component failure due to stress or wear. Faulty or malfunctioning parts can easily be identified before they hamper production or damage equipment.

Such preventive maintenance or diagnostics promise to increase the up-time of machines, tools and entire systems. Based on individual smart sensors that provide data to cloud-based big data analysis tools, new interconnected and interoperating services will help boost the factory up-time and productivity.

Estimates suggest it will be possible to achieve a drop of between 1 and 20 percent in the amount of unplanned and/or planned stops, depending on how efficient the system is in the first place. This would translate into a significant productivity boost.

Piab AB
P.O. Box 4501
SE-183 04 TÄBY
SWEDEN

Phone +46 (0)8 630 25 00
Fax +46 (0)8 630 26 90
E-mail info-sweden@piab.com
Website www.piab.com

Preset settings allows for real-time adjustments

Digital communications and internet connectivity will allow producers to store specific production "recipes" that include exactly the right operational settings for a variety of equipment and machinery. This will guarantee sustained maximised productivity following stops for maintenance or exchange of machine parts. Re-runs can also be made using exactly the same settings as during the first run.

The ability to use such an accurate "reset button" also provides opportunity for real-time adjustments of single or multiple settings without a major reset of the entire system.

Easy to simulate with software

The use of IO-Link and Bluetooth also facilitates software based simulation of new production components such as, for instance, new suction cups. To make it as easy as possible for customers to apply this to our products Piab is also working with third party apps for Mindsphere and other similar platforms. Mindsphere is an open cloud-based IoT operating system that enables you to connect your machines and physical infrastructure to the digital world.

Simulations of this kind are designed to increase the efficiency of, for instance, vacuum pumps. Estimates show that a pump that is 5 to 20 percent more efficient would result in a productivity gain of up to 10 percent.

Enables more energy-savings

Piab has already introduced numerous energy saving features that can be built on and further expanded through the addition of internet connectivity. Features such as ES, Automatic Level Determination (ALD), Automatic Condition Monitoring (ACM), Automatic Blow-Off (ABO), Intelligent Blow-Off (IBO) and Automatic Timer Blow-Off (ATBO) all contribute to a reduced energy consumption. In large vacuum systems, these features can help reduce the air consumption by up to 90 percent in every cycle.

Access to cloud-based big data analysis tools will further strengthen the ability to monitor and control energy consumption, assuring even more energy-efficient production. For example, data from one production site can be compared with data from other sites, helping to adjust settings for maximised efficiency.

Vacuum conveyors and lifting systems will also be piSMART™

In the near future, Piab plans to introduce a growing number of new piSMART™ and "Industry 4.0"-ready products. piCOMPACT® and other high-end vacuum ejector systems will be the first

Piab AB
P.O. Box 4501
SE-183 04 TÄBY
SWEDEN

Phone +46 (0)8 630 25 00
Fax +46 (0)8 630 26 90
E-mail info-sweden@piab.com
Website www.piab.com

Piab products to use the piSMART™ app, but other products will follow their lead. For instance, work is underway on a more intelligent vacuum conveyor that will utilise the piSMART™ app to optimise the conveying cycle, and Piab's Vaculex division is developing a more user-friendly vacuum lifting system with communication links to the piSMART™ app.

IoT moves from fridges to factories

Most people have probably heard of IoT, but its industrial big brother IIoT is less well known

Fridges that make sure you never run out of milk already exist and apps that enable you to remotely control the heating in your home from your mobile phone are attracting more and more users. Internet connectivity is an increasingly popular feature in many consumer and household electronics products. The Internet-of-Things (IoT) is no longer viewed as marketing hype or science fiction, but as a reality that is promising to revolutionise our daily lives.

Although so far industry and its so called fourth industrial revolution, Industry 4.0, have struggled to keep up with the pace in the consumer sector, the Industrial Internet of Things (IIoT) is now gaining momentum. It will take some time to implement, new apps and services will become viable as the connectivity of the machines develops. Technology companies such as Piab are increasingly keen to offer their customers smart "Industry 4.0"-ready products.

Industry 4.0 requires cooperation

Resting on four core principles – interoperability, information transparency, technical assistance and decentralised decisions – Industry 4.0 is expected to optimise energy-efficiency and productivity.

Interoperability will make it easy to bring together different devices in interconnected systems, where adherence to international standards also guarantees compatibility with the devices of the future.

Information transparency will provide operators with a virtual overview of the industrial environment through the aggregation and contextualisation of sensory data.

Technical assistance will offer operators the support and cooperation of machines and devices that can make decisions and solve problems that are difficult or unsafe for humans to handle.

Decentralised decisions will increase the autonomy of devices, drastically reducing setup times, providing automatic optimisation and increasing productivity.

This requires a move towards more open source rather than proprietary technology. Industry 4.0 will not be introduced overnight, it requires cooperation between not only the machines but also the machine builders, and it will be implemented over a number of years in a step-by-step fashion.

Piab AB
P.O. Box 4501
SE-183 04 TÄBY
SWEDEN

Phone +46 (0)8 630 25 00
Fax +46 (0)8 630 26 90
E-mail info-sweden@piab.com
Website www.piab.com

piSMART™ is Piab's response

Piab's flagship all-in-one vacuum ejectors are as ready as they can be for the Industry 4.0 revolution. With piSMART™, we take a further step towards the interoperability, information transparency, technical assistance and decentralised decision-making that strive towards the common goal of maximised productivity and energy-efficiency. Get ready for more - piSMART™ is our response to the rallying call of Industry 4.0.

For more information, please contact:

Häla El Sheemy Washbrook, VP Marketing and Communications Manager
Tel: +46 (0) 8 630 25 74
E-mail: hala.e.washbrook@piab.com

About Piab: *Piab provides smart solutions for the automated world, helping thousands of end users and machine producers in e-commerce logistics, food, pharma, automotive and other manufacturing industries to improve energy-efficiency, productivity and working environments. With 430 employees and SEK 1bn in sales 2017, Piab is a global organization, serving customers in almost 70 countries from a network of subsidiaries and distributors. By leveraging the ongoing technological development in automation and robotics, and targeting high-growth segments and geographies, Piab's vision is to become the global leader in gripping and moving solutions. Learn more at www.piab.com.*